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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,458	12/23/2003	Tsuyoshi Kubota	90606.2/wa	8146
54071 7590 04/11/2007 YAMAHA HATSUDOKI KABUSHIKI KAISHA C/O KEATING & BENNETT, LLP 8180 GREENSBORO DRIVE SUITE 850 MCLEAN, VA 22102			EXAMINER KIM, CHONG HWA	
			ART UNIT 2167	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/743,458	Applicant(s) KUBOTA ET AL.	
	Examiner Chong H. Kim	Art Unit 2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24,31 and 32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24,31 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/23/03 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawing was received on Feb 7, 2007. The drawing is not approved for containing new matter.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the engine as recited in claims 23 and 31; and the vehicle as recited in claims 24 and 32 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The amendment filed Feb 7, 2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Fig. 19 as submitted in the drawing and the new paragraph on page 10 line 26 to indicate such illustration.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 7-15, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukai et al., U.S. Patent 4,693,139.

Mukai et al. shows, in Figs. 1-6, an engine having a split type connecting rod, the connecting rod comprising: a crank-pin hole (see Fig. 1); a valley 112, 122 formed on an inner circumferential surface 7 of the crank-pin hole; a fracture starting point groove 111, 121 formed at the base portion of the valley; wherein a width of the fracture starting point groove is less than a width of the valley (see Fig. 6); wherein the split type connecting rod is a nut-less type of connecting rod that is made of a forged material (col. 3, line 8); further comprising a small end portion 1 and a large end portion 2, wherein the large end portion includes the valley and the

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fracture starting point groove is formed in the large end portion; further comprising a rod portion 3 and a cap portion 2 sub 2; wherein a pair of the fracture starting point grooves are formed on the inner circumferential surface of the crank-pin hole; wherein an angle relative to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the pair of fracture starting point groove and the valley is approximately 45 degrees (see Fig. 6 and col. 3, lines 36-47); wherein an interior angle of the valley is approximately 90 degrees (see Fig. 6 and col. 3, lines 36-47); wherein a cross section of the valley is larger than a cross section of the fracture starting point groove (see Fig. 6); and wherein the valley includes a pair of sloped portions 112, 122; but fails to show the surfaces of the groove having an angle of about 10 degrees or less or parallel from/to the fracture plane.

It would have been an obvious matter of design choice to make the angle of fracture starting point groove of Mukai et al. less than 10 degrees or less from (or parallel to) the fracture plane, since such a modification would have involved a mere change in the shape of the groove. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, a discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233.

6. Claims 1-3 and 7-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spurny, U.S. Patent 6,125,536.

Spurny shows, in Figs. 1-5, a split type connecting rod comprising: a crank-pin hole 9; a valley D formed on an inner circumferential surface of the crank-pin hole; a fracture starting

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point groove 13 formed at the base portion of the valley; wherein a width of the fracture starting point groove is less than a width of the valley; wherein the valley is formed such that the base portion is located at a position where a ratio of a depth of the fracture starting point groove to a shortest distance from an opening of the fracture starting point groove to a bolt hole 11 (as measured at the mid-portion of the valley D in Fig. 2) is about 70% or more; wherein the split type connecting rod is a nut-less type of connecting rod that is made of a case material (see Abstract); further comprising a small end portion 1 and a large end portion 5, wherein the large end portion includes the valley and the fracture starting point groove is formed in the large end portion; further comprising a rod portion 3 and a cap portion; wherein a pair of the fracture starting point grooves are formed on the inner circumferential surface of the crank-pin hole; wherein a cross section of the valley is larger than a cross section of the fracture starting point groove; and wherein the valley includes a pair of sloped portions; but fails to show the surfaces of the groove having an angle of about 10 degrees or less or parallel from/to the fracture plane and the surface of the valley being about 45 degrees measured from the fracture plane.

It would have been an obvious matter of design choice to make the angle of fracture starting point groove of Spurny less than 10 degrees or less from (or parallel to) the fracture plane and the interior angle of the valley having 90 degrees, since such a modification would have involved a mere change in the shape of the groove or the valley. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, a discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233.

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7. Claims 1, 2, 7-15, 21-24, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Mukai et al.

AAPA shows, in Figs. 1A and 1B, an engine, particularly in a vehicle, having a split type connecting rod, the connecting rod comprising: a crank-pin hole 50a; a fracture starting point groove 51; further comprising a rod portion and a cap portion; wherein a pair of the fracture starting point grooves are formed on the inner circumferential surface of the crank-pin hole; wherein upper and lower inner surfaces of the fracture starting point grooves are formed such that the surfaces are parallel to a predetermined fracture plane; but fails to show a valley having surfaces positioned about 45 degrees measured from the fracture plane and bottom surface of the groove having an arc shape.

Mukai et al. shows, in Fig. 6, a split type connecting rod comprising a valley 112, 122 formed on an inner circumferential surface 7 of the crank-pin hole; a fracture starting point groove 111, 121 formed at the base portion of the valley; wherein a width of the fracture starting point groove is less than a width of the valley (see Fig. 6); wherein an angle relative to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the pair of fracture starting point groove and the valley is approximately 45 degrees (see Fig. 6 and col. 3, lines 36-47); wherein an interior angle of the valley is approximately 90 degrees (see Fig. 6 and col. 3, lines 36-47); wherein a cross section of the valley is larger than a cross section of the fracture starting point groove (see Fig. 6); and wherein the valley includes a pair of sloped portions 112, 122.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the shape of the fracture starting configuration of AAPA by

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providing the valley as taught by Mukai et al. in order to effectively prevent the damages or generating cut power on the reverses of the split metals, as described from col. 3, line 48 to col. 4, line 3 by Mukai et al.

As to the matter of the groove having an arc shape, it would have been obvious to make the flat straight bottom surface of AAPA with a rounded surface since the Examiner takes Official Notice of the fact that the rounded surface of the fracture starting groove would provide a more accurate cutting plane location than the flat straight bottom surface and such method would be within the level of ordinary skill in the art. Furthermore, in respect to the ratio H/R being between 1 to 10, it would have been obvious matter of design choice to provide such range in AAPA or Mukai et al. A discovery of optimum range within prior art general conditions is generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233

8. Claims 1, 2, 4-20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al., U.S. Patent 6,312,159 B1 in view of Mukai et al.

Ishida et al. shows, in Figs. 1, 2, and 7, an engine (col. 1, line 17) having a split type connecting rod, the connecting rod comprising: a crank-pin hole 1d; a fracture starting point groove 21; further comprising a bearing locking groove 5a, 5b, 6a, 6b provided on the inner circumferential surface of the crank-pin hole, wherein the valley is formed at a position opposite to the bearing locking groove provided on the inner circumferential surface of the crank-pin hole; wherein the bearing locking groove includes a pair of concave portions located at positions that are deviated in the circumferential direction of the inner circumferential surface of the crank-pin

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hole; wherein the split type connecting rod is a nut-less type of connecting rod that is made of a cast material (die-formed); further comprising a small end portion 1b and a large end portion 1a, wherein the large end portion includes the fracture starting point groove is formed in the large end portion; further comprising a rod portion 1c and a cap portion 3; and wherein a pair of the fracture starting point grooves are formed on the inner circumferential surface of the crank-pin hole; but fails to show the surfaces of the groove having an angle of about 10 degrees or less or parallel from/to the fracture plane and a valley having surfaces positioned about 45 degrees measured from the fracture plane.

Mukai et al. shows, in Fig. 6, a split type connecting rod comprising a valley 112, 122 formed on an inner circumferential surface 7 of the crank-pin hole; a fracture starting point groove 111, 121 formed at the base portion of the valley; wherein a width of the fracture starting point groove is less than a width of the valley (see Fig. 6); wherein an angle relative to a predetermined fracture plane passing from a shaft center of the crank-pin hole through a bottom portion in a bottom surface of the pair of fracture starting point groove and the valley is approximately 45 degrees (see Fig. 6 and col. 3, lines 36-47); wherein an interior angle of the valley is approximately 90 degrees (see Fig. 6 and col. 3, lines 36-47); wherein a cross section of the valley is larger than a cross section of the fracture starting point groove (see Fig. 6); and wherein the valley includes a pair of sloped portions 112, 122.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the shape of the fracture starting configuration of Ishida et al. by providing the valley as taught by Mukai et al. in order to effectively prevent the damages or

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generating cut power on the reverses of the split metals, as described from col. 3, line 48 to col. 4, line 3 by Mukai et al.

As to the matter of the shapes of the sloped portions of the valley, it would have been an obvious matter of design choice to make the shape of the sloped portions of the valley of Mukai et al. with either curved, swelled and rounded, concaved, or rectilinear shape, since such a modification would have involved a mere change in the shape of the valley. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As to the matter of the surfaces of the groove having an angle of about 10 degrees or less or parallel to the fracture plane, it would have been an obvious matter of design choice to make the angle of fracture starting point groove of Ishida et al. less than 10 degrees or less from (or parallel to) the fracture plane, since such a modification would have involved a mere change in the shape of the groove. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). Furthermore, a discovery of optimum range within prior art general conditions is also generally recognized as being within the level of ordinary skill in the art. *In re Aller et al.*, 105 USPQ 233.

Response to Arguments

9. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

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10. In response to the applicant's argument regarding the allowability of claim 21, it is reminded that claim 21 was rejected based on indefiniteness in the previous Office action. Since the claim language was so unclear, no proper rejections based on prior art could have been made.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chong H. Kim whose telephone number is (571) 272-7108. The examiner can normally be reached on Monday - Friday; 9:00 - 5:00.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on (571) 272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

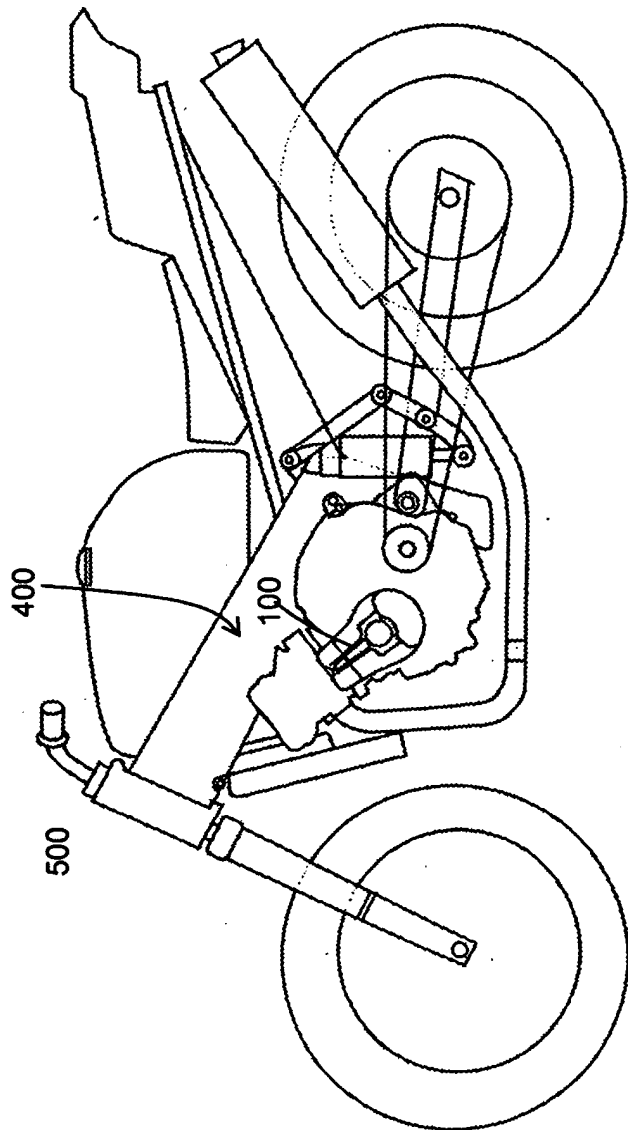
chk

April 9, 2007


CHONG H. KIM
PRIMARY EXAMINER

New Sheet

FIG. 19



not approved ca 4/6/07